from sample stations 15 and 17 and a control sediment, were subjected to chemical analysis of sediment. Sediments from all 21 sample stations, and the control sediment, were subjected to elutriates bioassays, and sediments bioassays. In addition, 28-day bioaccumulation studies were performed for the 21 sample stations sediments, and the control sediment. A sample of animals used in bioaccumulation studies was retained for baseline chemical level analysis. A joint review of sediment chemistry data by the Jacksonville District and EPA resulted in the decision to not run any chemistry on these tissues because of the low levels of analytes found in sediments (personnel telephone communication from Alex Lechich to Bob Pennington on 21 September 1993 at 1100 hrs EDST, no letter to follow for lack of time).

Methods used are detailed in Section 2.0, Methods and Materials, of the Final Report. The results of these analyses are presented in Section 3.0, Results and Discussion, of the Final Report. Analytical results are further reviewed below as appropriate. All results of chemical analysis are reported in dry weight values unless otherwise stated.

a. Sediment Analysis.

(1) Metals. Metals analysis results are displayed in table 3, pages 3-6 to 3-11, of the Final Report, Volume I. Results of the reference station data from the Puerto Nuevo study are included in the table.

Levels of heavy metals in the sediments varied between stations. Some were slightly elevated relative to the reference stations. However, no value reported was beyond the range of values reported for marine sediments or seemed to be high enough to cause adverse environmental impacts. The following comments on specific metals are offered.

(a) Aluminum (Al). Al is of interest primarily as it relates to the clay content of sediment and the levels of other metals in that sediment. Levels of Al reported in this study are compatible with the high clay content indicated by previous core borings and the sediment analysis reported in Volume II of the Final report. Small grain size sediment, ie, silt and clay, have a higher potential to attract and adsorb other metals.

(b) Arsenic (As). The amount of As detected in sediment samples for all sample stations and the reference stations is compatible with expected values for marine sediments which range in value from <0.4 to 455 ppm (NRCC, 1978).

(c) Cadmium (Cd). Korte (1983) reported background levels of Cd ranging up to 1 ppm in uncontaminated marine sediments. Cadmium levels reported for the sample sediments are not remarkable when compared to this information or to the reference sediments.

(d) Chromium (Cr). Rehm et al (1984) reported concentrations of Cr in marine sediments ranging from 3.9 ppm in intertidal sand to 162 ppm in anaerobic mud and indicated that Cr concentrations in sediment varied directly with the iron (Fe) and total organic carbon (TOC) content, and indirectly with grain size.

All Cr values reported in this study fall within the range reported by Rehm et al (1984). The highest value reported for a sample station in 57.3 ppm from sample station 20. This is below the highest reference station value reported (69.3 ppm).

(e) Copper (Cu). Judged primarily by comparison to references station values and considering the relatively low toxicity of Cu, the values displayed in table 3 of the Final Report are not abnormal or of concern.

(f) Iron (Fe). Fe content is of interest primarily as a way of interpreting the levels of other elements in the sediment. In general, all Fe levels are low from this study are low and are in line with the expected values.

(g) Lead (Pb). Pb in ocean sediments can vary from less than 10 to more than 80 ppm (Demayo et al., 1982), and Pb concentrations have been recorded at 110 ppm in an unpolluted lake (Haux et al., 1986). The highest lead value reported for all sample stations was 79.9 ppm at station 20. The highest level at a reference station was less than 17.6 ppm. Given these bench marks, the Pb levels from the project area can be considered to reflect minimal anthropogenic causes but are not at levels to cause adverse environmental impact.

(h) Mercury (Hg). Hg was detected at the levels above the detection limit of 0.1 ppm at all stations except stations except sample station 9. The average of 20 sample stations was 0.55 ppm with a range of 0.2 to 1.0 ppm.

As reported by NAS (1978) uncontaminated sediment usually has concentrations of Hg at less than <1.0 ppm. Based on this information, we do not believe that the Hg levels reported in San Juan Harbor are of concern an reflect little or no Hg contamination.

(i) Silver (Ag), Nickel (Ni), and Zinc (Zn). Based on the relatively low toxicity of Ag and Ni, and Zn, low levels of these metals in the samples, which are in general similar to the reference station values, there is nothing remarkable demonstrated in these results.

(j). Butlytin. Butlytin, primarily tributyltin (TBT), is reported to be toxic in very low concentrations in the water column. The Organotin Antifouling Paint Control Act of 1988 (OAPCA) limits leaching rate of TBT in antifouling paints to 4.0 ug/cm2/day and restricts its use to vessels longer than 25

meters except for aluminum hulls (Huggett et al., 1992). However, the half life of TBT in the water column has been documented at 4 to 14 days and some marine organism including algae, shrimp, crabs, and fish can metabolize TBT (Huggett, et al, 1992).

(2) Nutrients, Pesticides, PCBs, PAHs and Phenols No notable concentrations of nutrients were noted with the exception of TOC which indicated the very organic nature of the sediments tested. No pesticides, PCBs, PAHs, or phenolic compounds were detected in sediments from any station (Final Report, tables 4A-7).

c. Bioassays. Bioassays were conducted on elutriates of sediments and sediments from all samples and reference stations.

(1) Elutriate Bioassays. Elutrite bioassays were run for 96 hours using Mysidopsis bahia, Menidia beryllina and Crossostrea virginica. Tests for all three species were 1conducted in 0, 10, 50 and 100 percent concentration of elutrite. Evaluation of the results of these tests is performed using the Automated Dredging and Disposal Alternatives Management System (ADDAMS) model to predict dilution at the disposal site and determine if disposal of the DM will exceed the limiting permissible concentration (LPC). The results of this testing are presented in tables 8-13 of the Volume I or the Final Report. All results were obviously adequate and no ADDAMS analysis was conducted.

(2) Sediment bioassays were conducted using two species, Mysidopsis bahia and Ampelisca abdita. The results of the testing are presented in tables 14-16 of Volume I of the Final Report. The results of the bioassays were evaluated by comparing the mortality of each species at each sample station to the mortality of the species at the reference stations.

In accordance with the 1991 Green Book, if the mortality for Mysidopsis bahia exceeds the reference station by more than 10% and the data is statistically significant, the sediment does not meet the criteria for ocean disposal. The sediment bioassays produced a reference station mortality of 12.6%. Sample stations 8, 9, 10, 12, 13, 14, one of the duplicate tests of sample station 15, and sample stations 19 and 21 had mortalities that exceeded the reference stations average by more than 10%. All but sample stations 8 and 19 were statistically significant at the 0.5% confidence interval. All were statistically significant at the 0.01% confidence level. All other sample stations had mortality results that were within the acceptable range and meet the criteria for ocean disposal based on the Mysidopsis bahia bioassays.

In accordance with the 1991 Green Book, if the mortality for Ampelisca abdita exceeds the reference station by more than 20% and the data is statistically significant, the sediment does not

meet the criteria for ocean disposal. No sample station exceeded the reference station mortality by more than 20% therefore, meet the criteria for ocean disposal based on the Ampelisca abdita bioassays.

d. Bioaccumulation tests. No bioaccumulation chemistry was performed as agreed upon by the Corps and EPA.

V. **General Compatibility of Dredged Material with Disposal Site.** Data displayed in Appendix B shows that DM likely to be disposed at the ODMDS is sand and silt with traces of shell. Comparisons with the EIS data for the ODMDS shows that the dredged material is physically compatible with the material at the disposal site.

VI. **Need for Ocean Disposal.** Upland disposal options in the vicinity of San Juan Harbor are very limited and inadequate for disposal of either new work or maintenance dredged material. The limited upland disposal space that is available should be reserved for sediments that are not suitable for ocean disposal. For the majority of the DM from port expansion and maintenance, there is no economically feasible alternative to ocean disposal.

VII. **Environmental Impacts of Disposal.**

a. Aesthetics. The location and the distance offshore of the ODMDS should minimize the adverse aesthetics impact of turbidity during discharge.

b. Recreation Resources. No adverse impacts are expected.

c. Commercial marine resources. No commercial fishery or resources would be affected.

d. Navigation. No adverse impacts are expected.

e. Mineral resources. No adverse impacts are expected.

f. Cultural resources. No adverse impacts are expected.

g. Endangered species. No adverse impacts are expected.

h. Water quality. There will be a temporary increase in turbidity during discharge operations. This turbidity will be short lived and limiting permissible concentrations of contaminants will not be exceeded

VIII. **Determination and findings.**

In general, the material from this project is demonstrated by this evaluation to be clean and suitable for ocean disposal. No individual chemical tested for was identified at a level that would exclude this material from ocean disposal. Ampelisca bioassay results were very high for all stations.

The significance of the failures of sediments from sample stations 9, 10, 12, 13, 14, and 21 to pass the Mysodopsis bioassays is questionable. Sample stations 9, 10 and 12 are outside of the present navigation channels. No chemical analysis of sediments from either of these stations indicates any contamination problems. We do not believe that the mortality at sample stations 9, 10, 12, 13, 14 and 221 are a result of contamination. Also, the very high rate of Ampelisca survival at all sample stations indicates no problems with sediment from these stations.

Based on this evaluation, the Jacksonville Districts of the U. S. Army Corps of Engineers proposes that sediments in the project area as described in the Sample Plan and Protocol are suitable for ocean disposal and requests the concurrence of the Environmental Protection Agency for ocean disposal of dredged material within the defined project area for a period of three years for both port expansion and maintenance dredging.

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APPENDIX - II

Endangered Species Act
Consultation

CESAJ-PD-ES

29 November 1993

MEMORANDUM FOR RECORD

SUBJECT: Telecons 11-8-93 with Susan Sealander (USFWS) and Eric Hawk (NMFS) concerning Corps' NO EFFECT Endangered Species Act (ESA) Determination for SJ Harbor (SJH) O&M dredging.

1. I called agency representatives to request that their existing concurrence with the Corps' NO EFFECT determination for SJHI be applied to the SJH O&M Project as the latter is less environmentally disruptive in scope.

2. Both agency reps. concurred provided all appropriate precautions applied to SJHI are required on SJH O&M as well.

3. Mr. Hawk also requested that an observer be posted on board, if a hopper dredge is used for maintenance dredging, to confirm that sea turtles are not present when dredging occurs.

4. I indicated that the above requested precautions/conditions would be included as part of any contract for the subject work.

William J. Lang Jr.

William J. Lang Jr.
Biologist

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
9450 Koger Boulevard
St. Petersburg, Florida 33702

November 1, 1993 F/SEO13:EH

Mr. A. J. Salem
Chief, Planning Division
Jacksonville District, Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Attn: Barbara Cintrón

Dear Mr. Salem:

We have received and reviewed a facsimile copy of "Attachment A: Blasting Procedures", which was inadvertently omitted from your September 7, 1993 letter in which you re-initiate consultation under Section 7 of the Endangered Species Act (ESA) for the San Juan Harbor Navigation Project.

A Biological Assessment (BA) has been submitted pursuant to the requirements of Section 7 of the ESA. We have reviewed the BA and concur with your determination that populations of endangered/threatened species under our purview would not be adversely affected the proposed action.

This concludes consultation responsibilities under Section 7 of the ESA. However, consultation should be reinitiated if new information reveals impacts of the identified activity that may affect listed species or their critical habitat, a new species is listed, the identified activity is subsequently modified or critical habitat determined that may be affected by the proposed activity.

If you have any questions please contact LCDR Eric Hawk, Fishery Scientist, at 813/893-3366.

Sincerely yours,

Charles A. Oravetz

for Andrew J. Kemmerer
Regional Director

cc:
FWS - Boquerón

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Caribbean Field Office
P.O. Box 491
Boqueron, Puerto Rico 00622

October 18, 1993

Chief A. J. Salem
Planning Division
Department of the Army
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Re: San Juan Harbor
Federal Navigation
Project

Dear Chief Salem:

Thank you for your letter of September 7, 1993, concerning the above-mentioned project. Our comments are provided under Section 7 of the Endangered Species Act of 1973, as amended (87 stat. 884; 16 U.S.C. 1531, et seq.). Your letter requested our concurrence with your determination of no effect on the following threatened and endangered species:

Brown pelican	Pelecanus occidentalis
Yellow-shouldered blackbird	Agelaius xanthomus
Antillean manatee	Trichechus manatus manatus

The letter states that the leatherback (Dermochelys coriacea), green (Chelonia mydas), hawksbill (Eretmochelys imbricata), and loggerhead (Caretta caretta) sea turtles as well as other marine mammals may also occur in the adjacent waters.

The proposed project involves the deepening of the Bar, Anegado, Army Terminal, Puerto Nuevo and Graving Dock channels in the San Juan Bay. Blasting will be necessary in the Bar channel. All dredge material will be disposed of at the EPA-designated Offshore Disposal Area, 3 miles north of Isla de Cabras.

Because no disturbance of the shoreline is anticipated, the Biological Assessment states that the project is not likely to adversely affect either the brown pelican or the yellow-shouldered blackbird. We concur with this determination.

The Biological Assessment did not anticipate adverse affects for the Antillean manatee or the above-mentioned sea turtles. The document states, however, that there is negative evidence on the presence of manatees in the Bay. The Service's aerial surveys indicate that a manatee has been sighted in the Bay.

Neverthess, measures were included to minimize any potential for collisions. We concur with the determination of no adverse affects to the manatee, but recommend that these measures be included as conditions of any contract. These include:

1. The contractor and his agents should be made aware of the possible presence of manatees and sea turtles and their protection under the Endangered Species Act. All personnel will be advised that there are civil and criminal penalties for harming, harassing, or killing manatees.

2. Should the species be observed at the disposal area or within 100 yards of the project area, all work shall stop until the animal has left the area. No marine mammal will be harassed in order to make it leave the area.

3. Towing vessel captains must post a watch for turtles and manatees and take measures to avoid collisions.

4. Blasting protection measures outlined in Appendix A will be implemented.

5. If a manatee is injured or killed during the project, the Fish and Wildlife Service, Caribbean Field Office (809/851-7297) and the Caribbean Stranding Network (809/380-0025) will be notified.

The National Marine Fisheries Service should be consulted concerning impacts to species under their jurisdiction, such as sea turtles in the water and other marine mammals. No further consultation with the Fish and Wildlife Service under Section 7 of the Endangered Species Act is required. However, if the project is modified or if additional information on listed or proposed species is obtained consultation should be reinitiated.

Sincerely,

James P. Oland
Field Supervisor

ss
cc:
COE, San Juan
NMFS, St. Petersburg

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
9450 Koger Boulevard
St. Petersburg, Florida 33702

September 16, 1993 F/SEO13:EH

Mr. A. J. Salem
Chief, Planning Division
Jacksonville District, Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Mr. Salem:

This responds to your letter of September 7, 1993 in which you re-initiate consultation under Section 7 of the Endangered Species Act (ESA) for the San Juan Harbor Navigation Project. A Biological Assessment (BA) was submitted pursuant to the requirements of Section 7 of the ESA. You request our concurrence with your determination of no adverse effect on listed species under NMFS purview.

We have reviewed the BA; unfortunately it is incomplete. The blasting procedures (Appendix A to the BA) the USACE proposes to use during deepening of the Bar Channel were not attached to the BA as stated in your letter. If you will provide us with the missing document, we will promptly review them and reach a determination.

If you have any questions please contact LCDR Eric Hawk, Fishery Scientist, at 813/893-3366.

Sincerely yours,

Charles A. Oravetz

Charles A. Oravetz
Chief, Protected Species
Management Branch

September 7, 1993

Planning Division
Environmental Branch

Mr. James P. Oland, Field Supervisor
Caribbean Field Office
U.S. Fish and Wildlife Service
P.O. Box 491
Boquerón, Puerto Rico 00622

Dear Mr. Oland:

This letter re-initiates consultation under Section 7 of the U.S. Endangered Species Act for the San Juan Harbor Federal Navigation Project. We received your agency's comments in response to our public scoping request for information in March 1993, and provided additional information and maps as part of our responsibilities under the Fish and Wildlife Coordination Act (FWCA) in April and May, 1993. To date you have not identified listed endangered or threatened species as an issue of concern for the project. We are aware that the San Juan bay geographic area is habitat for the listed species brown pelican (Pelecanus occidentalis) and the yellow shouldered blackbird (Agelaius xanthomus). Near offshore waters are also known habitat for west indian manatee (Trichechus manatus) and migrating humpback whales.

The referenced navigation project will not impact mangroves or other pelican roosting habitat, nor has it the potential to interfere with potential yellow shouldered blackbird habitat. It is expected that dredging would be by means of a dragline or clamshell dredge mounted on a barge. Disposal of dredged materials is expected to be at the EPA-approved offshore disposal area marked on maps supplied to Mr. Lopez of your office.

Our files show that you concurred with a Corps Biological Assessment and determination of no adverse effect on listed species during designation of the San Juan Harbor Offshore Disposal Site in 1989, and concurred again during last year's coordination of the EA for the Rio Puerto Nuevo Flood Control project.

The only new element in the present study is the probability that we would need to utilize blasting to loosen hard rock during deepening of the Bar Channel since the substrate is rock in places. We have determined that blasting would not adversely affect pelicans or blackbirds, and have only negative information on the occurrence of other species under Service jurisdiction (manatees or humpback whales) inside San Juan Bay. We enclose

herewith a copy of blasting specifications developed to protect manatees and other marine mammals for our Florida projects. We have determined that adoption of these specifications would avoid any potential adverse effects of blasting on marine mammals, should any be present in the project area, but have also determined that this occurrence is highly unlikely.

Please inform us at your earliest convenience of your concurrence with our assessment. Barbara Cintrón (Telephone 904-232-1692) is environmental study manager for the San Juan Harbor study. Please contact her if you have any questions.

Sincerely,

A. J. Salem
Chief, Planning Division

Enclosure

bcc: PD-PS
DS
DS-PD (José Martínez)
DP-I

Cintrón/CESAJ-PD-ES/1692
Kurzbach/CESAJ-PD-ES
Smith/CESAJ-PD-E
Davis/CESAJ-PD-A
Salem/CESAJ-PD

September 7, 1993

Planning Division
Environmental Branch

Mr. Charles A. Oravetz, Chief
Protected Species Management Branch
NOAA, National Marine Fisheries Service
Southeast Regional Office
9450 Koger Blvd.
St. Petersburg, Florida 33702

Dear Mr. Oravetz:

This letter is to re-initiate consultation under Section 7 of the U.S. Endangered Species Act for the San Juan Harbor Navigation Project. We received your agency's comments in response to our public scoping request for information in March 1993, but were not notified of any particular concerns with listed species under your Agency's jurisdiction. There are no records of sea turtle, whale or dolphin sightings in the water inside San Juan Harbor. Near offshore waters are also known habitat for West Indian manatee (Trichechus manatus) and migrating humpback whales(Megaptera novaeangliae). It is expected that dredging would be by means of a dragline or clamshell dredge mounted on a barge. Disposal of dredged materials is expected to be at the EPA-approved offshore disposal area marked on NOAA charts of the North Coast of Puerto Rico. This site is about 3 miles offshore, in waters 800 to 1200 feet deep.

Although your agency commented on seagrass beds in the project area, a study conducted by the U.S. Fish and Wildlife Service in 1982 found that these beds did not exist. There were red algal beds in an inner harbor channel, in close proximity to a former sewage outfall. We know of no marine turtle habitat in San Juan Harbor or its Bar channel. Our files show that in March 1992 you concurred with a Corps Biological Assessment and determination of no adverse effect on listed species during coordination of the EA for the Rio Puerto Nuevo Flood Control project.

The only new element in the present study is the probability that we would need to blast to loosen hard rock during deepening of the Bar Channel, prior to removing the broken rock and overlying sand with the dredge. Although we consider the probability of occurrence of any listed species in the blasting area to be extremely low, we have developed reasonable measures to avoid causing adverse effects on protected species. The attached Biological Assessment addresses blasting specifications,

both to avoid damage to adjacent masonry structures and to avoid injury to marine mammals. The USACE has determined that, with the conditions and precautions we would incorporate into the project, no adverse effects on listed species would occur.

Please inform us at your earliest convenience of your concurrence with our determination. Barbara Cintrón (Telephone 904-232-1692) is environmental study manager for the San Juan Harbor study in the Environmental Branch. Please contact her if you have any questions.

Sincerely,

A. J. Salem
Chief, Planning Division

Enclosure

bcc: DS
DS-PD (José Martínez)
DP-I

Cintrón/CESAJ-PD-ES/1692
Kurzbach/CESAJ-PD-ES
Smith/CESAJ-PD-E
Davis/CESAJ-PD-A
Salem/CESAJ-PD

U. S. ENDANGERED SPECIES ACT
BIOLOGICAL ASSESSMENT
SAN JUAN HARBOR NAVIGATION STUDY
SAN JUAN, PUERTO RICO

1. Project Location. The project is located within San Juan Bay in the Bar, Anegado, Army Terminal, Puerto Nuevo and Graving Dock commercial shipping channels, extending seaward to the outer end of the bar (entrance) channel. Please refer to the enclosed map.

2. Authorization. Harbor improvements for navigation in San Juan Bay have been authorized periodically since 1917. The present project was authorized by the Water Resources Development Act of 1986.

3. Description. Improvements under study at this time include deepening of channels by means of dredging. Depths would be increased up to 10 feet in the Bar channel and up to 8 feet in other channels, to accomodate modern vessels. Most of the materials to be removed are clays and silts, but a part of the entrance channel, which would also be widened on its western side, has a sandy and rocky substrate. Blasting would be necessary in this area to fracture the rock and facilitate its removal by dredge. Blasting charges would be maintained in a range recommended by geotechnical engineers as adequate to avoid damage to historic masonry structures. Blasting safety specifications have also been developed to avoid injury to any marine reptiles or mammals that might incidentally occur in the blasting area, and are hereby appended. The dredging method would be by clamshell or dragline mounted on a barge. **NO HOPPER DREDGES WOULD BE USED.** All dredged materials would be disposed of at an EPA-designated Offshore Disposal Area. Biological and chemical testing of materials proposed for offshore disposal is now underway. The San Juan offshore disposal site is marked on NOAA navigation charts. It is located about 3 miles north of Isla de Cabras in water depths that range from 800 to 1,200 feet.

4. Listed species. Preliminary scoping of issues for the study was carried out in April of 1993. Neither the U.S. Fish and Wildlife Service (FWS) nor the National Marine Fisheries Service(NMFS) identified any listed species as present in the immediate project area, in their responses to scoping inquiries. However, the U.S. Army Corps of Engineers (USACE) has determined, based on past coordination of other projects in the geographic area, that the following listed species might occur in San Juan Harbor:

Yellow-shouldered Blackbird, Agelaius xanthomus.
Brown Pelican, Pelecanus occidentalis.

Other listed organisms are the four species of marine turtles regularly observed in Puerto Rico waters: Dermochelys coriacea, the leatherback, Chelonia mydas, the green turtle,

Eretmochelys imbricata, the tortoiseshell, and Caretta caretta, the loggerhead); the West Indian Manatee (Trichechus manatus); and migrating Humpback whales (Megaptera novaeangliae). None of the other endangered marine mammal species (including whales) listed as present in Puerto Rico coastal waters occur close enough to shore to be potentially affected by activities in the harbor.

5. Discussion of the Potential Impacts to Listed Species. Impacts on the two avian species would be related to disturbance of feeding, loafing and roosting habitat (for the pelican) or disturbance of mangrove habitat (for the blackbird). Since no disturbance of shorelines, mangroves or roosts is contemplated, USACE has determined that the project is not likely to adversely affect either of the above avian species.

Any potential adverse effects on the marine species listed in the above paragraph could be related to three aspects of the project under study: 1) Dredging and related blasting in the Bar (entrance) channel; 2) Transport of materials by barge to the offshore disposal site; and 3) Disposal at sea of the dredged materials.

A. Effect of disposal at sea. Materials will be transported in a barge to the disposal area, where they will be discharged over the side at the designated site. Barges will be towed by tugs. These rather slow-moving vessels are not believed to pose any threat to marine mammals or marine turtles. The contractor and his agents will be made aware of the potential presence of marine turtles and marine mammals in the area, federal penalties for taking listed species, and will be required to post a watch at all times when the vessel is underway or dumping dredged materials. Should one of the above listed species or other marine mammal species be present in the area all disposal shall stop until the animal(s) has left the area. No marine mammal will be harassed to make it leave the area.

B. Effect of dredged material transport. Of the species listed above, only the manatee and/or mating turtles are slow-moving enough to potentially be under threat of collision from a moving tug vessel. Towing vessel captains will be required to post a watch for turtles and manatees and take measures to avoid collision. The habits of the West Indian manatee Caribbean area populations are dissimilar to those of the Florida subspecies. West Indian manatees generally inhabit coastal waters of a depth sufficient to allow the animals to escape boat collisions by sounding. There are very few manatee stranding records for Puerto Rico that have been linked to damage from large propellors such as those used on commercial vessels (Rathbun et al. 1986). Manatees are regularly sighted off the shallow beaches of Levittown, to the west of the project area, and from high floors in the Condado-Isla Verde residential area to the east, but USACE has no information on sightings within or in the approaches to San Juan Harbor. Sea turtles are regularly sighted off San Juan

Harbor, but generally sound (dive) quickly when approached by motor vessels. It is not believed that they are in any danger of collision from a towing vessel.

C. Effect of dredging and related activities (blasting). There are no verified records of either marine mammals or marine turtles in the San Juan Harbor entrance channels, nor are they observed anywhere inside San Juan Bay. Humpback whales are observed every year near the channel approach (outside the harbor) during the January-March months when their annual migration takes them in an eastward direction along the north coast of Puerto Rico. The animals travel parallel to shore, are easily spotted from nearby buildings and El Morro, and often have young calves accompanying mature females. The "window" during which humpbacks appear extends from early January through mid-March. Other whales may occasionally be spotted far offshore, but are unlikely to travel near the harbor entrance. To avoid any possibility of affecting migratory whales, dolphins or other marine mammals while the controlled blasting under the entrance channel is underway, the USACE proposes to enact the blasting proceedures in Appendix A. This procedure was developed by USACE in coordination with the U.S. Fish and Wildlife Service, to avoid adverse effects to manatees in the Intracoastal Waterway in Florida, is based on mammalian body tissues' sensitivity to blast impacts in the water, and has been determined to be adequate to avoid injury due to blasting.

6. Determination. Based on the above analysis, on information presently available, observations of DNR and FWS biologists consulted, and the West Indian Manatee recovery plan, the USACE has determined that implementation of the project under the proposed protection measures would lead to no adverse effects on any of the above listed species.

REFERENCES

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U.S. Fish and Wildlife Service. 1991. Humpback Whale. In: Endangered and Threatened Species of the Southeast United States: "The Red Book."

APPENDIX A.

Proposed Marine mammal protection measures during blasting at San Juan Harbor Bar Channel

1. Blasting protection measures will be implemented as specified below:

a. For each explosive charge placed, detonation will not occur if a marine mammal is known to be (or based on previous sightings, may be) within a circular area around the detonation site with the following radius:

$$r = 260 \times \sqrt[3]{W}$$

where:

r = radius of the danger zone in feet
W = weight of the explosive charge in pounds (tetryl or TNT)

b. A marine mammal watch will be conducted by no less than two qualified observers from small watercraft, at least one half hour before and after the time of each detonation, in a circular area at least three times the radius of the above described danger zone.

c. Any marine mammal(s) in the danger zone or the watch zone shall not be forced to move out of those zones by human intervention. Detonation shall not occur until the animal(s) move(s) out of the danger zone on its own volition.

d. In the event a marine mammal is injured or killed during blasting, the U.S. Fish and Wildlife Service, Boquerón Field Office will be notified at 809-851-7273.

(2) Precautions will be taken during construction activities to insure the safety of manatees and other marine mammals. To insure the contractor and his personnel are aware of the potential presence of the manatee in the project area, their endangered status, and the need for precautionary measures, the contract specifications will include the standard protection clauses concerning manatees. The contractor will instruct all personnel associated with the construction of the project about the possible presence of manatees in the area and the need to avoid injury to manatees. All personnel will be advised that there are civil and criminal penalties for harming, harassing, or killing manatees, which are protected under the Endangered Species Act and the Marine Mammal Protection Act. The contractor

shall be held responsible for any turtle, manatee, whale or other marine mammal harmed, harassed, or killed as a result of the construction of the project. If a manatee is sighted within 100 yards of the project area, appropriate safeguards will be taken, including suspension of work, if necessary, to avoid injury to manatees.

APPENDIX - III

Coastal Zone Management Act
Consistency Determination

December 1, 1993

Planning Division
Environmental Resource Branch

Mrs. Norma Burgos, President
Puerto Rico Planning Board
P.O. Box 41119
Minillas Station
San Juan, Puerto Rico 00940-9985

Dear Mrs. Burgos:

The U.S. Army Engineer District, Jacksonville proposes to maintenance dredge San Juan Harbor in 1994. We have determined that this activity would be consistent with Puerto Rico's Coastal Zone Management Program.

Enclosed are 7 copies of the Application for Certification of Consistency with the Puerto Rico Coastal Management Program Form and a map showing the proposed maintenance dredge areas. Please note this activity is not associated with the proposed San Juan Harbor Widening and Deepening Improvement Project for which a separate consistency determination will be conducted.

If you concur with our determination, please provide your response at your earliest convenience.

Sincerely,

A.J. Salem
Chief, Planning Division

Enclosures

APPENDIX - IV

Coordination Documentation

OFFICE OF THE GOVERNOR
LA FORTALEZA

Control 93-3139

November 1, 1993

Mr. A.J. Salem
Chief
Planning Division
Department of the Army
Jacksonville District COE
P.O. Box 4970
Jacksonville, FL 32232-0019

Attn: Planning Division, Environmental Branch

SHPO #03-18-93-01 IMPROVEMENTS TO FEDERAL NAVIGATION CHANNELS IN SAN JUAN HARBOR, SAN JUAN

Dear Mr. Salem:

Our Office has received your letter of September 16, 1993 regarding the above referenced project. We have also read the attached addendum "Evaluation of Blasting Operations Impact to Historic Structures Near the Entrance Channel to San Juan, P.R. Harbor" prepared by John Brown. It is our opinion that the proposed blasting should not have an effect on historic structures included in or eligible for inclusion in the National Register of Historic Places. We also agree with the importance of monitoring seismic activity during blasting to ensure the protection of historic sites on either side of the channel.

We would also like to point out that our comments of September 20, 1993 concerning submerged resources remain in effect. Specifically, the need for further documentation of anomaly 6:7 and the verification of the existence of a 16th - 18th century warship submerged near the vicinity of buoy R-4.

Finally, we recommend you contact the Council for Underwater Archaeology, in San Juan, for their comments and recommendations.

STATE HISTORIC PRESERVATION OFFICE
SAN JOSE ST. # 109 / BOX 82 / OLD SAN JUAN, PUERTO RICO 00901 / TELEPHONE 721-3737 / FAX 723-0957

If you have any questions concerning our comments, please contact our archaeologist, Miguel Bonini, in our Office. Your interest and cooperation in helping to protect Puerto Rico's archaeological and historical resources are appreciated.

Cordially,

Arleen Pabón PhD
State Historic Preservation Officer

AP/MB/mro

c Carmelo Cáez
Corps of Engineers
San Juan, PR

Dr. Awilda Palau
President
Council for Underwater Archaeology

OFFICE OF THE GOVERNOR
LA FORTALEZA

Control 93-2656

September 20, 1993

Mr. A.J. Salem
Chief
Planning Division
Department of the Army
Jacksonville District COE
P.O. Box 4970
Jacksonville, FL 32232-0019

Attn: Planning Division, Environmental Branch

RE: SHPO#04-13-93-05 DEEPENING AND WIDENING THE CHANNEL AT SAN JUAN HARBOR, SAN JUAN, PUERTO RICO

Dear Mr. Salem:

Our Office has reviewed the archaeological study "Cultural Resource Magnetic Anomaly Identification Investigation in San Juan Harbor, Puerto Rico" prepared by Daniel Koski-Karell for the above referenced project. The report recommends the archaeological mitigation of anomaly 6:7, identified as a steel-hulled vessel with good structural integrity, built and operated between 1900 and 1950. We feel that insufficient information has been supplied to make a decision as to the vessel's eligibility to the National Register. In order to make this determination, we believe that further archival research is necessary.

However, we concur with the report's recommendation that further survey work is needed in the vicinity of buoy R-4 in order to determine whether a 16th - 18th century warship is located in the area, as per information provided to Koski-Karell by three local informants.

We also recommend you to contact the Council for Underwater Archaeology, in San Juan, for their comments and recomendations.

STATE HISTORIC PRESERVATION OFFICE
SAN JOSE ST. # 109 / BOX 82 / OLD SAN JUAN, PUERTO RICO 00901 / TELEPHONE 721-3737 / FAX 723-0957

If you have any questions concerning our comments, please contact our archaeologist, Miguel Bonini, in our Office. Your interest and cooperation in helping to protect Puerto Rico's archaeological and historical resources are appreciated.

Cordially,

Arleen Pabón PhD
State Historic Preservation Officer

AP/MB/mro

c Archl. Marisol Meléndez
Consejo de Arqueología Subacuática

COMMONWEALTH OF PUERTO RICO

OFFICE OF THE GOVERNOR
SAN JUAN, PUERTO RICO 00901

September 16, 1992

Col. Stephen R. Benton
Deputy District Engineer
for the Antilles
U.S. Corps of Engineers
400 Fernández Juncos Avenue
San Juan, PR 00901

Dear Colonel Benton:

The Port of San Juan constitutes the main port center in Puerto Rico and as such is vital to our economic growth. It serves not only the cruise ship industry, but also the main cargo industry which handles goods particularly at the Puerto Nuevo docks area.

For quite some time now, the Puerto Rico Shipping Association, the San Juan Bay Pilots Association, the U.S. Coast Guard, the Puerto Rico Ports Authority and other members of industry have expressed their concern on the actual channel depth limitations on the Army Terminal Channel in San Juan Bay. This operational deficiency is caused by the shoaling and silting conditions which pose a safety hazard to navigation. The limitations imposed to the shipping industry and the Puerto Rican economy are substantial. Furthermore, the increase for ship draft cannot be optimized due to this situation.

In our continuous effort to improve the development of Puerto Rico, we are requesting that the USCE take the necessary action so that dredging be performed expeditiously providing for a safe Army Terminal Navigation Channel thus avoiding further efficiency restrictions to industry, specially those related to energy generation.

In the event that our participation is deemed necessary to obtain federal funding for this project do not hesitate to contact my Advisor in Federal Affairs, Mr. Fernando Lloveras San Miguel, to coordinate these actions.

Cordially,

Rafael Hernández Colón